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EUROPEAN PATENT APPLICATION

21 Application number: 89850167.1

51 Int. Cl.⁴: D 21 F 9/00
 D 21 B 1/06

22 Date of filing: 19.05.89

30 Priority: 20.05.88 FI 882400

43 Date of publication of application:
 06.12.89 Bulletin 89/49

64 Designated Contracting States:
 DE ES FR GB IT SE

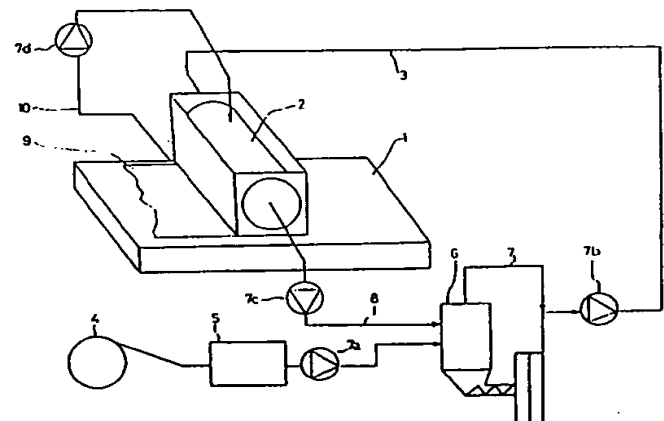
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54 Feeding system for the former of a dry-paper machine.

57 The invention is related to a feeding system for the former of a dry-paper machine, in which feeding system the fibre material is disintegrated in such a form as is required by the former. A system according to the invention comprises a shredder, in which the chemical pulp web gets preshredded, a disc refiner, in which the preshredded chemical pulp gets defibrated, and fibre material transport devices between the various parts of the system for a continuous feeding of the former.



Description

FEEDING SYSTEM FOR THE FORMER OF A DRY-PAPER MACHINE

This invention is related to a feeding system for the former of a dry-paper machine, in which feeding system the fibre material is disintegrated in such a form as is required by the former.

The former of a dry-paper machine usually comprises a screening tanklike or tubular treating space, into which the web-forming fibre material is fed with air stream. In these apparatuses an even distribution of fibre material is sought by recirculating it and spreading it into a layer of even thickness on the forming wire. The former is normally fed with chemical pulp shredded, or disintegrated, in a hammer mill; and into the hammer mill the chemical pulp is fed direct from the roll.

In comparison with other paper manufacturing methods, known systems of this type have the drawback that the raw material's fineness is relatively modest and the controllability of its properties poor. For this reason the manufacture of dry paper of finer quality, for instance, has been if not impossible then at least too costly as compared to other paper manufacturing methods.

The object of this invention is to eliminate the above-mentioned disadvantages and create a system that has none of them and with which the forming stage in the manufacture of dry paper is at least technically raised to the level of other paper manufacturing methods. To achieve this, a system according to the invention is characterized by that it comprises a shredder, in which the chemical pulp web gets preshredded, a disc refiner, in which the preshredded chemical pulp gets defibrated, and fibre material transport devices between the various parts of the system for a continuous feeding of the former.

By using a refiner type known in the first place from the manufacture of TMP and CTMP pulps as a defibrator in connection with a dry paper former, it is possible to achieve with the help of a preshredder a defibration more effective and more controllable and thus obtain better paper quality. For the controllability of the process, a disc refiner is much better than a hammer mill because the width of the refiner gap, the profile of the cutting elements, and other parameters can be freely determined, ever according to the raw material and the required product. Even at its highest, the cost of defibration here will not exceed the cost of defibration with other pulp production methods because the same kind of apparatus is used.

The main explanation why the disc refiner has so far not been used in connection with the manufacture of dry paper is that the low humidity of the raw material of dry paper in comparison with other defibrated raw materials (for instance wood chips) seems to mean less steam generated and a smaller process pressure and therefore a decrease in the effect of the refiner. It should also be borne in mind that the manufacture of dry paper as a whole is still relatively new technology; for instance formers frequently constitute a quality bottleneck (tendency

to form fibre lumps) in dry-paper machines that easily nullifies the benefits of a finer raw material (produced for instance with a disc refiner). In these circumstances there has been little incentive to think about ways of getting the raw material even finer, especially as it might have only aggravated the existing problems.

Accordingly, the invention is based on the insight new to a person skilled in the art that it is both possible and economical to use a disc refiner in the manufacture of dry paper and that it is possible to construct the former so that it, for instance in continuous interaction with the defibration equipment, can fully utilize the defibration capacity of the disc refiner.

Thus an advantageous embodiment of a system according to the invention is characterized by that it includes devices for conveying into the disc refiner for a new defibration the material that has been rejected or otherwise remained unscreened in the former.

Other advantageous embodiments of a system according to the invention are characterized by what is presented in the patent claims below.

In the following, the invention is explained in more detail by using an example, with reference being made to the attached drawing showing an embodiment of a system according to the invention.

The figure shows a dry-paper machine's former unit 1, which has a rotating cylindrical former drum 2 with a perforated mantle. The fibre material is fed through a pipe 3 into the drum 2, which disperses the fibres into an even fibre web 9 on the wire running under the drum. In the example the fibre material is formed in accordance with the invention by shredding rolled chemical pulp 4 in a preshredder 5 and, sped up by a blower 7a, transporting it into a disc refiner 6 equipped with a feeding funnel and a conveyor screw, where the actual defibration occurs. A blower 7b raises the pressure in the pipe 3 if the process pressure of the refiner is not enough for transporting the fibres into the former drum 2.

Fibres and fibre flocks that have travelled through the drum 2 are fed with a blower 7c through a pipe 8 back into the refiner 6. In the figure is also seen a secondary circuit for the blast air of the drum, in which the air that has been sucked through the wire is returned with a blower 7d through a pipe 10 to act as a cleaning jet over the drum. Thus all air and fibre material circuits in the system are essentially closed.

It is obvious to a person skilled in the art that the various embodiments of the invention are not restricted to the example presented above, but can be varied within the scope of the following patent claims. Accordingly, the refiner can be equipped with various accessories for instance for feeding arrangements or to control the steam generated in the process. And for a multiphase refining of the fibre material, the refiner can also have more than one phase.

Claims

1. Feeding systems for the former of a dry-paper machine, in which feeding system the fibre material is disintegrated in such a form as required by the former, wherein the system comprises a shredder, in which the chemical pulp web gets preshredded, a disc refiner, in

which the preshredded chemical pulp gets defibrated, and fibre material transport devices between the various parts of the system for a continuous feeding of the former.

2. System according to claim 1, the system including devices for conveying into the disc refiner for a new defibration the material that has been rejected or otherwise remained unscreened in the former.

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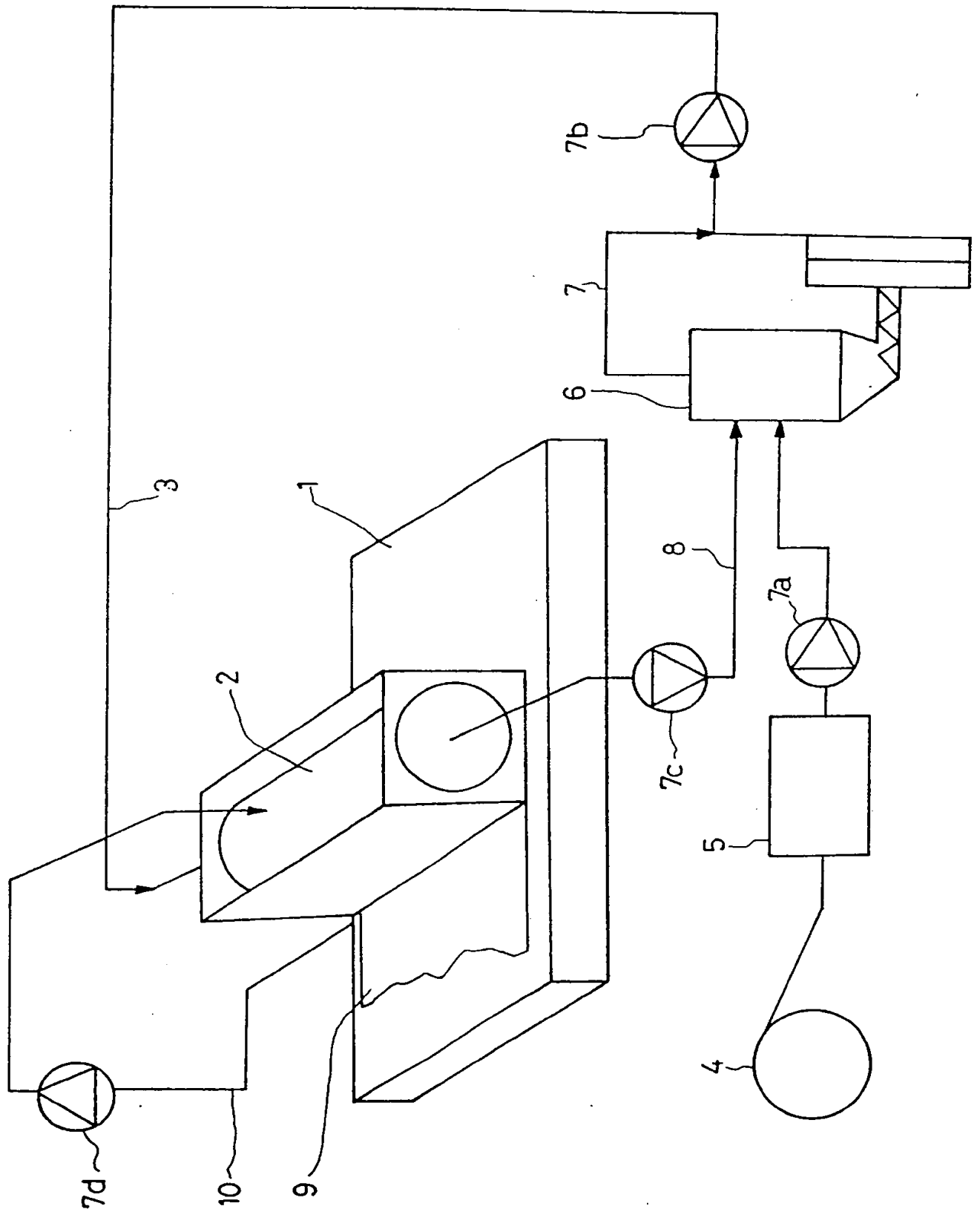
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Europäisches Patentamt
European Patent Office
Office européen des brevets



Publication number:

0 345 234 A3

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84 Designated Contracting States:
DE ES FR GB IT SE

68 Date of deferred publication of the search report:
07.08.91 Bulletin 91/32

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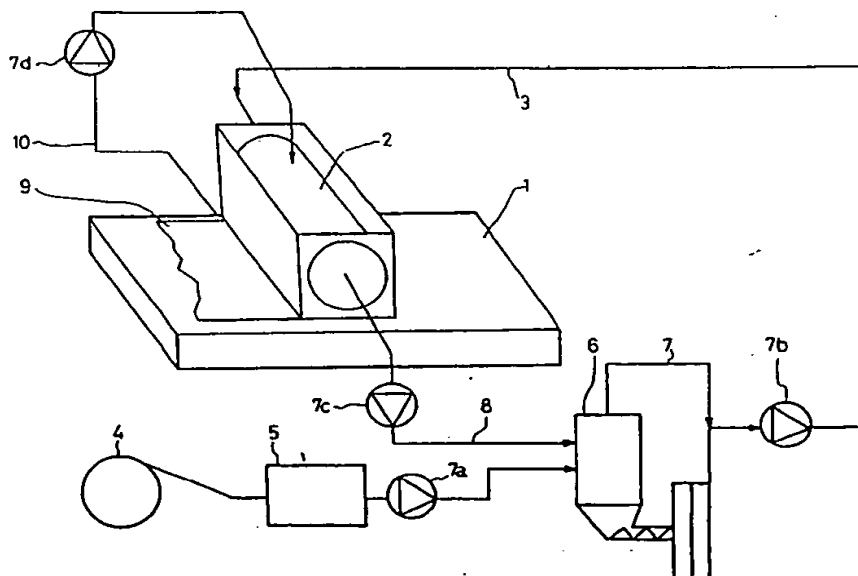
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EP 0 345 234 A3



European
Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 85 0167

DOCUMENTS CONSIDERED TO BE RELEVANT					
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)		
X	GB-A-1 129 695 (MO OCH DOMSJO AB) * Whole document *	1	D 21 F 9/00		
Y	-----	2	D 21 B 1/06		
Y	GB-A-2 096 661 (J.M. VOITH GmbH) * Whole document *	2			
A	EP-A-0 032 772 (SCANWEB I/S) * Whole document *	1,2			
A	DE-A-2 757 581 (ESCHER WYSS GmbH) * Whole document *	2			
A	DE-A-1 940 953 (SPOERL) -----				
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)		
			D 21 F D 21 B D 21 H		
The present search report has been drawn up for all claims					
Place of search The Hague		Date of completion of search 07 May 91	Examiner ELMEROS C.		
<table border="0"><tr><td>CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention</td><td>E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &: member of the same patent family, corresponding document</td></tr></table>				CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention	E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &: member of the same patent family, corresponding document
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